What is claimed is:

1. An electrophoresis apparatus comprising:

a first electrode in a first electrode zone;

a second electrode in a second electrode zone, wherein the second electrode is disposed relative to the first electrode so as to be adapted to generate an electric field in an electric field area therebetween upon application of a selected electric potential between the first and second electrodes;

a first membrane disposed in the electric field area;

a second membrane disposed between the first electrode zone and the first membrane so as to define a first interstitial volume therebetween, wherein the first interstitial volume is separated from the first and second electrode zones by the first and second membranes, and wherein at least one of the membranes is a barrier membrane capable of controlling substantial bulk movement of liquid under the influence of an electric field; and

means adapted to communicate fluids to the first electrode zone, the second electrode zone, and the first interstitial volume wherein at least one of the fluids contains a sample constituent, wherein the application of the selected electric potential causes at least one of

at least a portion of any liquid within the sample constituent to migrate through at least one membrane into an adjacent electrode zone, and

at least a portion of the sample constituent to migrate through at least one membrane into the first interstitial volume, and

wherein the at least one barrier membrane controls substantial bulk movement of liquid into and out of the first interstitial volume so as to obtain at least a partially concentrated product in the first interstitial volume.

2. The apparatus according to claim 1 further comprising means adapted to receive a selected voltage and means adapted to apply a selected electric potential corresponding thereto across at least the electric field area.

3. The apparatus according to claim 1 further comprising means adapted for removing any heat generated in the apparatus.

4. The apparatus according to claim 1 wherein the at least one barrier membrane is an inducible electro-endo-osmotic membrane.

5. The apparatus according to claim 4 wherein the inducible electro-endo-osmotic membrane is selected from the group consisting of cellulose tri-acetate, polyvinyl alcohol, poly(vinyl alcohol) cross-linked with glutaraldehyde, and combinations thereof.

6. The apparatus according to claim 4 wherein the inducible electro-endo-osmotic membrane has a defined pore size.

7 The apparatus according to claim 6 wherein the inducible electro-endo-osmotic membrane has a defined pore size ranging from about 5 kDa to about 1000 kDa.

8. The apparatus according to claim 1 wherein the at least one barrier membrane is adjacent to at least one of the first and second electrode zones.

9. The apparatus according to claim 1 wherein at least one of membranes is an electrophoresis separation membrane having a defined pore size.

10. The apparatus according to claim 9 wherein the electrophoresis separation membrane is made from polyacrylamide.

11. The apparatus according to claim 10 wherein the electrophoresis separation membrane has a defined pore size ranging from about 1 to about 2000 kDa.

12. An electrophoresis apparatus comprising:

a first electrode in a first electrode zone;

a second electrode in a second electrode zone, wherein the second electrode disposed relative to the first electrode so as to be adapted to generate an electric field in an electric field area therebetween upon application of a selected electric potential between the first and second electrodes;

a first membrane disposed in the electric field area;

a second membrane disposed between the first electrode zone and the first membrane so as to define a first interstitial volume therebetween;

a third membrane disposed between a second electrode zone and the first membrane so as to define a second interstitial volume therebetween, wherein the first interstitial volume is separated from the first electrode zone by the second membrane and the second interstitial volume is separated from the second electrode zone by the third membrane, and wherein at least one of the membranes is a barrier membrane capable of controlling substantial bulk movement of liquid under the influence of an electric field; and

means adapted to communicate fluids to the first electrode zone, the second electrode zone, the first interstitial volume, and the second interstitial volume, wherein at least one of the fluids contains a sample constituent, wherein the application of the selected electric potential causes at least one of

at least a portion of any liquid within the sample constituent to migrate through at least one membrane into an adjacent electrode zone, and

at least a portion of the sample constituent to migrate through at least one membrane into at least one of the interstitial volumes, and

wherein the at least one barrier membrane controls substantial bulk movement of any liquid into and out of at least one of the interstitial volumes so as to obtain at least a partially concentrated product in at least one of the interstitial volumes.

13. The apparatus according to claim 12 further comprising means adapted to receive a selected voltage and means adapted to apply a selected electric potential corresponding thereto across at least the electric field area.

14. The apparatus according to claim 12 wherein the apparatus further comprises means adapted for removing any heat generated in the apparatus.

15. The apparatus according to claim 12 wherein the at least one barrier membrane is an inducible electro-endo-osmotic membrane.

16. The apparatus according to claim 15 wherein the inducible electro-endo-osmotic membrane is selected from the group consisting of cellulose tri-acetate, polyvinyl alcohol, poly(vinyl alcohol) cross-linked with glutaraldehyde, and combinations thereof.

17. The apparatus according to claim 16 wherein the inducible electro-endo-osmotic membrane has a defined pore size.

18. The apparatus according to claim 17 wherein the inducible electro-endo-osmotic membrane has a defined pore size ranging from about 5 kDa to about 1000 kDa.

19. The apparatus according to claim 12 wherein the at least one barrier membrane is adjacent to at least one of the first and second electrode zones.

20. The apparatus according to claim 12 wherein at least one of membranes is an electrophoresis separation membrane having a defined pore size.

21. The apparatus according to claim 20 wherein the electrophoresis separation membrane is made from polyacrylamide.

22. The apparatus according to claim 21 wherein the electrophoresis separation membrane has a defined pore size ranging from about 1 to about 2000 kDa.

23. An electrophoresis system comprising:

a first electrode in a first electrode zone;

a second electrode in a second electrode zone, wherein the second electrode disposed relative to the first electrode so as to be adapted to generate an electric field in a first electric field area therebetween upon application of a selected electric potential between the first and second electrodes;

a first membrane disposed in the first electric field area;

a second membrane disposed between the first electrode zone and the first membrane so as to define a first interstitial volume therebetween;

a third membrane disposed between a second electrode zone and the first membrane so as to define a second interstitial volume therebetween, wherein the first interstitial volume is separated from the first electrode zone by the second membrane and the second interstitial volume is separated from the second electrode zone by the third membrane;

means adapted to communicate fluids to the first electrode zone, the second electrode zone, the first interstitial volume, and the second interstitial volume, wherein at least one of the fluids contains a sample constituent, wherein the application of the first selected electric potential causes at least a portion of the sample constituent to migrate through at least one membrane into at least one of the interstitial volumes to form a partially separated sample;

a third electrode in a third electrode zone;

a fourth electrode in a fourth electrode zone, wherein the third electrode disposed relative to the fourth electrode so as to be adapted to generate an electric field in a second electric field area therebetween upon application of a second selected electric potential between the third and fourth electrodes;

a fourth membrane disposed in the second electric field area;

a fifth membrane disposed between the third electrode zone and the fourth membrane so as to define a third interstitial volume therebetween, wherein the third interstitial volume is separated from the third and fourth electrode zones by the fourth and fifth membranes, wherein at least one of the fourth and fifth membranes is a barrier membrane capable of controlling substantial bulk movement of liquid under the influence of an electric field; and

means adapted to communicate fluids to the third electrode zone, the fourth electrode zone, and the third interstitial volume, wherein at least one of the fluids contains at least a partially separated sample from at least one of the first and second interstitial volumes, wherein the application of the selected electric potential causes at least one of

at least a portion of any liquid within the partially separated sample to migrate through at least one membrane into an adjacent electrode zone, and

at least a portion of the first partially concentrated product to migrate through at least one membrane into third the interstitial volumes, and

wherein the at least one barrier membrane controls substantial bulk movement of any liquid into and out of the third interstitial volumes so as to obtain at least a partially concentrated product in the third interstitial volume.

24. The apparatus according to claim 23 further comprising means adapted to receive a first selected voltage and means adapted to apply a first selected electric potential corresponding thereto across the first electric field area; and means adapted to receive a second selected voltage and means adapted to apply a second selected electric potential corresponding thereto across the second electric field area.

25. The apparatus according to claim 23 wherein the apparatus further comprises means adapted for removing any heat generated in the apparatus.

26. The apparatus according to claim 23 wherein the at least one barrier membrane is an inducible electro-endo-osmotic membrane.

27. The apparatus according to claim 26 wherein the inducible electro-endo-osmotic membrane is selected from the group consisting of cellulose tri-acetate, polyvinyl alcohol, poly(vinyl alcohol) cross-linked with glutaraldehyde, and combinations thereof.

28. The apparatus according to claim 27 wherein the inducible electro-endo-osmotic membrane has a defined pore size.

29. The apparatus according to claim 28 wherein the inducible electro-endo-osmotic membrane has a defined pore size ranging from about 5 to about 1000 kDa.

30. The apparatus according to claim 23 wherein the at least one barrier membrane is adjacent to at least one of the first and second electrode zones.

31. The apparatus according to claim 23 wherein at least one of membranes is an electrophoresis separation membrane having a defined pore size.

32. The apparatus according to claim 31 wherein the electrophoresis separation membrane is made from polyacrylamide.

33. The apparatus according to claim 32 wherein the electrophoresis separation membrane has a defined pore size ranging from about 1 to about 2000 kDa.

34. A method for concentrating a sample, the method comprising:

communicating fluids to a first electrode zone and a second electrode zone, wherein the first and second electrode zones each contain an electrode and the second electrode zone is disposed relative to the first electrode zone so as to be adapted to generate an electric field in an electric field area therebetween upon application of a selected electric potential between the first and second electrodes;

communicating a fluid to a first interstitial volume defined by a first membrane disposed in the electric field area and a second membrane disposed between the first electrode zone and the first membrane, wherein the first interstitial volume is separated from the first and second electrode zones by the first and second membranes, and wherein at least one membrane is a barrier membrane capable of controlling substantial bulk movement of liquid under the influence of an electric field, and wherein at least one of the fluids communicated to the electrode zones and the first interstitial volume contains a sample constituent; and

applying a selected electric potential across at least the electric field area, wherein the application of the selected electric potential causes at least one of

at least a portion of any liquid within the sample constituent to migrate through at least one membrane into an adjacent electrode zone, and

at least a portion of the sample constituent to migrate through at least one membrane into the first interstitial volume, and

wherein the at least one barrier membrane controls substantial bulk movement of any liquid into and out of the first interstitial volume so as to obtain at least a partially concentrated product in the first interstitial volume.

35. The method according to claim 34 wherein the method further comprises collecting the concentrated product from the first interstitial volume.

36. A method for moving at least one component from a sample while controlling the bulk movement of liquid, the method comprising:

communicating fluids to a first electrode zone and a second electrode zone, wherein the first and second electrode zones each contain an electrode and the second electrode zone is disposed relative to the first electrode zone so as to be adapted to generate an electric field in an electric field area therebetween upon application of a selected electric potential between the first and second electrodes;

communicating fluids to a first interstitial volume and a second interstitial volume, wherein the first interstitial volume is defined by a first membrane disposed in the electric field area and a second membrane disposed between the first electrode zone and the first membrane, wherein the second interstitial volume is defined by the first membrane and a third membrane disposed between the first membrane and the second electrode zone, wherein the first interstitial volume is separated from the first electrode zone by the second membrane and the second interstitial volume is separated from the second electrode zone by the third membrane, and wherein at least one membrane is a barrier membrane capable of controlling substantial bulk movement of liquid under the influence of an electric field, and wherein at least one of the fluids communicated to the electrode zones and interstitial volumes contains a sample constituent; and

applying a selected electric potential across at least the electric field area, wherein the application of the selected electric potential causes at least one of

at least a portion of any liquid within the sample constituent to migrate through at least one membrane into an adjacent electrode zone, and

at least a portion of the sample constituent to migrate through at least one membrane into at least one of the interstitial volumes, and

wherein the at least one barrier membrane controls substantial bulk movement of any liquid into and out of at least one of the interstitial volumes so as to obtain at least a partially concentrated product in at least one of the interstitial volumes.

37. The method according to claim 36 wherein the method further comprises collecting a concentrated product from at least one of the first and second interstitial volumes.

38. A method for moving at least one component from a sample while controlling the bulk movement of liquid, the method comprising:

communicating fluids to a first electrode zone and a second electrode zone, wherein the first and second electrode zones each contain an electrode and the second electrode zone is disposed relative to the first electrode zone so as to be adapted to generate an electric field in a first electric field area therebetween upon application of a selected electric potential between the first and second electrodes;

communicating fluids to a first interstitial volume and a second interstitial volume, wherein the first interstitial volume is defined by a first membrane disposed in the first electric field area and a second membrane disposed between the first electrode zone and the first membrane, wherein the second interstitial volume is defined by the first membrane and a third membrane disposed between the first membrane and the second electrode zone, wherein the first interstitial volume is separated from the first electrode zone by the second membrane and the second interstitial volume is separated from the second electrode zone by the third membrane, and wherein at least one of the fluids communicated to the electrode zones and interstitial volumes contains a sample constituent;

applying a selected electric potential across at least the first electric field area, wherein the application of the first selected electric potential causes at least a portion of the

sample constituent to migrate through at least one membrane into at least one of the interstitial volumes to form a partially separated sample;

collecting the partially separated sample from at least one of the first and second interstitial volumes;

communicating fluids to a third electrode zone and a fourth electrode zone, wherein the third and fourth electrode zones each contain an electrode and the fourth electrode zone is disposed relative to the third electrode zone so as to be adapted to generate an electric field in a second electric field area therebetween upon application of a selected electric potential between the third and fourth electrodes;

communicating a fluid to a third interstitial volume defined by a third membrane disposed in the second electric field area and a fifth membrane disposed between the third electrode zone and the fourth membrane, wherein the first interstitial volume is separated from the third and fourth electrode zones by the fourth and fifth membranes, wherein at least one of the fourth and fifth membranes is a barrier membrane capable of controlling substantial bulk movement of liquid under the influence of an electric field, and wherein at least one of the fluids communicated to the electrode zones and the third interstitial volume contains at least the concentrated sample from at least one of the first and second interstitial volumes; and

applying a selected electric potential across at least the second electric field area, wherein the application of the selected electric potential causes at least one of

at least a portion of any liquid within the first partially concentrated product to migrate through at least one membrane into an adjacent electrode zone, and

at least a portion of the partially concentrated sample to migrate through at least one membrane into third the interstitial volumes, and

wherein the at least one barrier membrane controls substantial bulk movement of any liquid into and out of the third interstitial volumes so as to obtain at least a partially concentrated product in the third interstitial volume.

39. The method according to claim 38 wherein the method further comprises collecting the concentrated product from the third interstitial volume.